

# DATA INFORMATION DISPLAY METHOD OF DATA BROADCASTING RECEIVER AND APPARATUS THEREOF

## BACKGROUND OF THE INVENTION

5

### 1. Field of the Invention

660260  
10 The present invention relates to a data information display method of a data broadcasting receiver and an apparatus thereof, in particular to a data information display method of a data broadcasting receiver and an apparatus thereof which is capable of displaying data information corresponding to the present audition television picture as a simple data information picture without changing the size of the present audition television picture.

### 2. Description of the Prior Art

15 Generally, in a digital data broadcasting, additional data information is transmitted from a transmitter to a receiver with an A/V (Audio/Visual) stream for a television by using digital signals.

20 In the digital data broadcasting, the transmitter compacts separately the video and audio, encodes it, multiplexes it, and transmits the data stream to the receiver, then the receiver receives the data stream, corrects all errors, decodes it, and demultiplexes it into the original video and audio.

25 In order to watch the digital data broadcasting, an additional data processing SW program for a digital broadcasting (hereinafter, it is referred to a data browser) is required for the receiver in order to process the A/V stream and data and support collectively various kinds of user support services, and the

format and function of the data browser is similar to the format and function of an internet web browser.

The internet web browser is a SW program based on the internet, it comprises a plurality of internet protocols, a HTML (Hyper Text Markup Language) document, a CSS (Cascading Style Sheets) Parser, a Java Script, a JAVA related engine, a formatting function for display, its own program, and it supports most of e-mail protocols.

In addition, basic functions of the data browser used for the data information display apparatus of the data broadcasting receiver will now be described.

The data browser judges whether data is received related to the present audition broadcasting, detects the data when the data is received, informs the data receiving to a viewer by displaying an icon on a screen, and prepares a parsing, formatting, displaying of the received data information.

After that, when the viewer wants to watch the data information receiving at the present and selects a "television and data broadcasting simulcast audition" item by using a remote-controller or an external input device, the data information picture is displayed, when the viewer does not watch the receiving data information, the present audition general television picture is displayed.

FIG.1 is a block diagram illustrating the conventional data information display apparatus of the data broadcasting receiver, it comprises a tuner 10 for tuning signals received through an antenna, an A/V decoder unit 20 for converting the signal tuned on the tuner 10 into an A/V stream, a screen 30 for displaying the A/V stream outputted from the A/V decoder unit 20 on a screen, a data receiving unit 40 (listener) for searching whether there is the data information among the

signals tuned on the tuner 10, and a PE (Presentation Engine) unit 50 for parsing and formatting the data information detected by the data receiving unit 40 and outputting the data information having the displayable format to the screen 30.

Herein, the PE unit 50 comprises a user interface 57 for being inputted an input signal of the viewer, a parsing unit 51 for being inputted the user input signal through the user interface and parsing the data information outputted from the data receiving unit 40, a formatting unit 63 for formatting the data information outputted from the parsing unit 51 in order to display, and a display unit 55 for processing the data information formatted on the formatting unit 63 so as to have the displayable format and transmitting it to the screen 30.

Herein, the parsing unit 51 parses the data information outputted from the data receiving unit 40 by using the HTML (Hyper Text Markup Language) document, CSS (Cascading Style Sheet) Parser, Java Script ect..

The operation of the data information display apparatus of the general data broadcasting receiver having the above-mentioned construction will now be described.

First, the signal received through the antenna is tuned on the tuner 10, the tuned A/V signal is outputted to the A/V decoder unit 20, the A/V decoder unit converts the tuned signal into the A/V stream. The A/V stream is displayed on the screen 30.

Meanwhile, the data receiving unit 40 detects whether there is the data information among the signals tuned on the tuner 10, and it stores when the data information is detected. After that, when the viewer requests the data information output through the user interface 57 while the data receiving unit 40 receives the data information, the parsing unit 51 detects and parses the data information

stored on the data receiving unit 40, and outputs the parsed data information. And, the formatting unit 63 formats the data information outputted from the parsing unit 51, the display unit 55 receives the data information formatted on the formatting unit 63, processes the formatted data so as to have the displayable format, and transmits it to the screen 30.

FIG.2 is a flow chart illustrating the general data information display method of the data broadcasting receiver. First, it is detected whether the data information is received among the signals tuned on the tuner 10 through the antenna ST1, the general television picture is displayed when the data information is not detected ST6, when the data information is detected, as depicted in FIG.3a, the icon (for example, 'i') for informing the data information receiving is displayed on the right upper portion of the screen 30 ST2. At the same time, in order to output the received data information to the screen 30, the parsing, formatting, displaying are prepared ST3, when the viewer selects the data information ST4, in other words, when the viewer selects the "television and data information simulcast audition" icon through the remote-controller or external input device, as depicted in FIG.3b, the data information is displayed on the screen 30 ST30.

Meanwhile, when the viewer does not select the "television and data broadcasting simulcast audition" icon, the present audition general television picture is continually displayed ST6.

FIG.3a and 3b illustrate the general data information display method of the data broadcasting receiver, the construction of the picture can be changed according to the setting of the viewer.

Generally, because the switching of the picture is differently defined according to the received data information, when the data information picture is

displayed, the size of the present audition general television picture decreases or only the data information picture is displayed. As like this, the viewer can check the size of the data information picture only after switching into the data information picture.

5 In addition, when the general data information display apparatus of the data broadcasting receiver generates the icon for informing the data information receiving, before the viewer selects the "television and data broadcasting simulcast audition" item by using the remote-controller or external input device, the viewer can not know the content of the data information received at the present.

10 In addition, when the viewer selects the "television and data broadcasting simulcast audition" item by using the remote-controller or external input device, the present audition television picture is switched into the television picture and data information picture, herein an interrupt for replacing the present audition television picture occurs because the size of the present audition television picture has to be  
5 adjusted again. Accordingly, the present audition television picture can not be displayed for a certain time.

Therefore, when the present audition television picture is very important information, the viewer may not switch it into the data information picture, and it is impossible also to use the data information after a certain time, accordingly the  
20 viewer can not check the data information finally.

## SUMMARY OF THE INVENTION

Accordingly, the object of the present invention is to provide a data  
25 information display method of a data broadcasting receiver and an apparatus

thereof which is capable of knowing the present receiving data information even when a user does not select a "television and data broadcasting simulcast audition" item by using a remote-controller or an external input device.

The other object of the present invention is to provide the data information display method of the data broadcasting receiver and apparatus thereof which is capable of watching the received data information simply while the viewer watches the present audition television picture, and storing separately the received data information in order to use later in case of need.

The other object of the present invention is to provide the data information display method of the data broadcasting receiver and apparatus thereof which is capable of helping the viewer select the picture switching by displaying the television picture size information on a simple data information picture in advance when the viewer selects to switch into the simple data information picture.

In order to achieve the above-mentioned objects, the data information display apparatus of the data broadcasting receiver according to the present invention comprises a tuner 10 for tuning signals received through an antenna, an A/V decoder unit 20 for converting the signal tuned on the tuner 10 into an A/V stream, a screen 30 for displaying the A/V stream outputted from the A/V decoder unit 20 on a screen, a data receiving unit 40 (listener) for searching whether there is the data information among the signals tuned on the tuner 10, and a PE (Presentation Engine) unit 60 for parsing and formatting the data information detected by the data receiving unit 40 and outputting the data information having the displayable format to the screen 30.

Herein, the PE unit 60 comprises a user interface 69 for being inputted an input signal of the viewer, a parsing unit 61 for being inputted the user input signal

though the user interface unit 69 and parsing the data information outputted from the data receiving unit 40, a summary information extracting unit 67 as an additional module of the parsing unit 61 for extracting the abridged data content of the data information, a formatting unit 63 for formatting the data information  
5 outputted from the parsing unit 51 in order to display, and a display unit 65 for processing the data information formatted on the formatting unit 63 so as to have the displayable format and transmitting it to the screen 30.

Herein, the parsing unit 61 parses the data information outputted from the data receiving unit 40 by using the HTML (Hyper Text Markup Language) document, CSS (Cascading Style Sheet) Parser, Java Script ect..  
0

In order to achieve the above-mentioned objects, in the simple data information display method according to the present invention, it is detected whether the data information is received, when the data information is not detected, the general television picture is displayed, when the data information is detected, an icon for informing the data information receiving is displayed on a screen..  
5

After that, when the viewer selects the simple data information picture through the remote-controller or external input device, each HTML document among the data information outputted from the data receiving unit 40 is parsed, the title information of the each HTML document and the picture display size  
20 information are extracted, the information of the each linked document is extracted by using the extracted data information, and the simple data information display picture is constructed and displayed by using the all extracted information.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG.1 is a block diagram illustrating the general data information display apparatus of a data broadcasting receiver.

FIG.2 is a flow chart illustrating the general data information display method of the data broadcasting receiver.

FIG.3a and 3b illustrate the general data information display method of the data broadcasting receiver.

FIG.4a and 4b are block diagrams illustrating a data information display apparatus of a data broadcasting receiver according to the present invention.

FIG.5 is a flow chart illustrating a simple data information display method of the data broadcasting receiver according to the present invention.

FIG.6a and 6b illustrate the data information display method of the data broadcasting receiver according to the embodiment of the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG.4a and 4b are block diagrams illustrating a data information display apparatus of a data broadcasting receiver according to the present invention.

As depicted in FIG.4a, the data information display apparatus of the data broadcasting receiver according to the present invention comprises a tuner 10 for tuning signals received through an antenna, an A/V decoder unit 20 for converting the signal tuned on the tuner 10 into an A/V stream, a screen 30 for displaying the A/V stream outputted from the A/V decoder unit 20 on a screen, a data receiving unit 40 (listener) for searching whether there is the data information among the signals tuned on the tuner 10, and a PE (Presentation Engine) unit 60 for parsing and formatting the data information detected by the data receiving unit 40 and



outputting the data information having the displayable format to the screen 30.

Herein, the PE unit 60 comprises a user interface 69 for being inputted an input signal of the viewer, a parsing unit 61 for being inputted the user input signal though the user interface unit and parsing the data information outputted from the data receiving unit 40, a summary information extracting unit 67 for extracting the abridged data information of the data information, a formatting unit 63 for formatting the data information outputted from the parsing unit 61 in order to display, and a display unit 65 for processing the data information formatted on the formatting unit 63 so as to have the displayable format and transmitting it to the screen 30.

Herein, as depicted in FIG.4b, the parsing unit 61 parses the data information outputted from the data receiving unit 40 by using the HTML (hyper Text Markup Language) document, CSS (Cascading Style sheet) Parser and Java Script, and is connected to the summary information extracting unit 67 for extracting the title information, display size information, related link information by using the HTML document.

The operation of the data information display apparatus of the general data broadcasting receiver having the above-mentioned construction will now be described.

First, the signal received through the antenna is tuned on the tuner 10, the tuned A/V signal is outputted to the A/V decoder unit 20, the A/V decoder unit converts the tuned signal into the A/V stream. The A/V stream is displayed on the screen 30.

Meanwhile, the data receiving unit 40 detects whether there is the data information among the signals tuned on the tuner 10, and it stores when the data

information is detected. After that, when the viewer requests the data information output through the user interface 57 while the data receiving unit 40 receives the data information, the parsing unit 61 detects and parses the data information stored on the data receiving unit 40. The summary information extracting unit 67  
5 connected to the parsing unit 61 extracts the abridged data information among the HTML data information parsed on the parsing unit 61. And, the formatting unit 63 formats the data information outputted from the parsing unit 51, the display unit 55 is inputted the data information formatted on the formatting unit 63, processes the formatted data so as to have displayable format, and transmits it to the screen 30.

FIG.5 is a flow chart illustrating the data information display method of the data broadcasting receiver according to the present invention. First, it is detected whether the data information is received among the signals tuned on the tuner 10 through the antenna ST10, the general television picture is displayed when the data information is not detected ST80, when the data information is detected, an icon for informing the data information receiving is displayed on the picture.

After that, when the viewer selects the simple data information picture through the remote-controller or external input device, the HTML document among the data information (HTML and additional title) outputted from the data receiving unit is parsed ST20. In addition, the title information ST 30 and television size  
20 information ST40 of the each parsed HTML page, linked data, title information of the linked document are extracted ST50. As depicted in FIG.6a, the each link information such as a domestic race, a foreign race, race terms is constructed as a certain icon having a button shape by using the all extracted information, the each data title information corresponding to the each icon is linked and the simple data  
25 information display picture is constructed ST60, and the simple data information

display picture is displayed on the screen as a font having a translucent ground in order to make the each button uncover the television picture ST70.

Herein, the data of the ST30 are data used on the simple data information display window, the data of ST50 is used for making the link buttons of the simple data information picture.

Hereinafter, the operation will now be described in more detail, the HTML data of ST20 is parsed on the PE unit 60. The title information of ST30 is displayed as a tag same with the <title> inside of the each HTML document, accordingly the PE unit 60 can use the information by parsing it. In addition, the data of ST40 is defined in the each HTML file, accordingly the PE unit 60 can know the size of the television to be displayed. In addition, the PE unit 60 can know the link information of ST50 while parsing the HTML file. Accordingly, when the viewer selects the simple data information picture, the PE unit 60 constructs the simple data information picture and displays it.

When the viewer watches the present television picture and a data broadcasting informing icon is displayed on the screen 30, the viewer can select the "simple data information picture" or "data information picture" by using the remote-controller and external input device. When the viewer selects the "simple data information picture", the present television picture is displayed as it is, and the font having the translucent ground for informing the title information, television display size information, related link information is displayed on the present television picture without switching the television picture.

In addition, the information displayed on the simple data information picture is the simple information such as the title information among the data information.

When the viewer watching the simple data information picture selects the "data information picture" by using the remote-controller or external input device in order to watch the data information picture, the simple data information picture is directly switched into the data information picture.

5 In addition, because the simple data information picture displays the display size of the present broadcasting television picture on the data information picture, the viewer can be helped to determine whether he/she switches into the data information picture through the display size information about the present broadcasting television picture. In other words, the viewer can select the picture switching considering the display size of the present broadcasting television picture to be switched.

10 In addition, when the viewer does not want to switch the present audition television picture and also does not want to miss the present receiving data information, the present invention can store the present receiving data by selecting a storage button displayed on the right side of the picture. The data is stored on a built-in memory region not on a special device such as a digital VCR, it can be possible because the present receiving data is the data information not the AV content. Accordingly, the viewer can search the stored data as occasion demands.

15 FIG.6b illustrates the picture when the viewer selects the domestic race among the linked information of FIG.6a.

20 The domestic race link information informs a vehicle regulation, a race event, a stadium scale, a stadium map information through an information window. Likewise, when the viewer selects the foreign race, race terms and the information corresponding to the foreign race are displayed on the information display window.

25 Therefore, the viewer can watch the simple data information picture, data

information picture or general television picture according to his/her select, when the viewer selects the simple data information picture, the viewer can generally know the present receiving data information without switching the present audition television picture.

5           As described above, the data information display method of the data broadcasting receiver and the apparatus thereof according to the present invention is capable of helping the viewer to select the picture switching by informing in advance the present audition television picture size in the data information picture switching, accordingly the viewer can watch the present audition television picture  
10 faithfully while using the data, can separately store the data information, and can use it as occasion demands.

15

20

25